

*EFFECTS OF CHOICE OF STIMULI AS
REINFORCEMENT FOR TASK RESPONDING IN
PRESCHOOLERS WITH AND WITHOUT DEVELOPMENTAL DISABILITIES*

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The effects of choice and no choice of stimuli as reinforcement for task responding were investigated across preschoolers with and without disabilities. Five less preferred stimuli were identified for each participant using a stimulus preference assessment. No differences were found for choice and no-choice conditions when the less preferred stimuli were used as reinforcers.

DESCRIPTORS: choice, preference, preschool children, single operant

Studies on the effects of reinforcement choice have produced mixed results. One explanation for the discrepant findings may be that some studies on reinforcement choice have not controlled for the effects of preference. That is, choice-making opportunities may result in access to more highly preferred stimuli than in conditions in which choice is not available. Lerman et al. (1997) attempted to control for the effects of choice and preference by providing participants with access to high-preference stimuli across choice and no-choice conditions. Participants' rates of responding were equivalent across choice and no-choice conditions. Lerman et al. suggested that preference for stimuli may have produced a ceiling effect in that response rate could not be increased further by providing choice-making opportunities. If providing participants with access to highly preferred stimuli produces a ceiling effect, a clearer effect of choice might be observed by removing or reducing the effects of high-preference items. Therefore, the purpose of

the current study was twofold: (a) to determine the effects of choice of reinforcers using less preferred stimuli as reinforcers, and (b) to determine the effects of choice in preschoolers with and without mild developmental disabilities.

METHOD

Five children who attended a combined preschool program at a local elementary school served as participants. Cary was a 5-year-old girl who had been diagnosed with Noonan's syndrome. Jim was a 5-year-old boy with developmental delays in cognitive, personal-social, and language skills. Jack was a 5-year-old boy with developmental delays in cognitive, personal-social, adaptive, communication, and fine motor skills. Tina and Andrea were 5-year-old girls who were typically functioning. Sessions occurred over a 10-week period, once per day, four times per week in the school. However, Andrea's data for comparison conditions were collected in her home approximately 1 month after data were collected for the other 4 participants.

Materials used in the preference assessment included a variety of stimuli generated for each participant by asking his or her parents to provide a list of 16 items. Preference for each item was determined using the

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paired-choice method described by Fisher *et al.* (1992). The items approached on 40% or less of the trials during the assessment were identified as less preferred stimuli. Of these items, the five stimuli with the lowest percentages of approach responses were included in this study. Both consumable (e.g., popcorn, lemonade) and nonconsumable (e.g., stickers, toy car) items were included. The consumable items were provided in small quantities that permitted quick consumption (i.e., within 30 s).

Responses were measured using a matching game, Colors & Shapes Match Me Game. Responses involved selecting and matching six colored shape cards and placing the matching cards on the corresponding spaces on the game board so that all six sections of the game board had the corresponding game card on top of it. The number of game board completions per minute for each session was determined by dividing the number of game board completions by session length (10 timed minutes: total session time minus total time for choices [for choice condition only] and reinforcer access).

A combined alternating treatments within a multiple baseline across participants design was used to compare the reinforcing effects of choice and no choice of consequent stimuli. Baseline sessions lasted 10 min. During these sessions, one game board and 24 cards were placed approximately 0.7 m from the participant. The participant was told to begin the game. The session timer began when all materials necessary for the target response were placed in front of the participant. The session timer was stopped when the participant completed a game board. Timing resumed when a new game board was placed in front of the participant. No consequences were given for baseline responses.

During the choice and no-choice conditions, all variables were the same as those in baseline with the exception of the provision of consequences for game board completion.

Choice and no-choice sessions were selected by the flip of a coin. Reinforcers were delivered on a continuous (fixed-ratio 1) schedule. Before each opportunity to respond (i.e., prior to each presentation of the game board) in the choice condition, the participant was told that he or she would be allowed to choose the reinforcer after a game board completion. When each participant completed a game board, the session timer was stopped. Three stimuli were presented randomly from the five less preferred stimuli indicated during the preference assessment, and the participant was allowed to choose one item. Five seconds were allowed for the choice to be made (there were no instances when participants did not make a choice). Prior to each presentation of the game board during no-choice sessions, each participant was told that the trainer would choose the reinforcer after the participant completed a game board. The trainer presented this item when the participant completed each game board. The specific items, as well as the order in which they were presented, were identical (yoked) to those chosen during the immediately preceding choice session. Participants in both conditions were allowed to have access to consequent stimuli (i.e., handle nonedible items and consume edible ones) for approximately 30 s. A new game board was presented to the participant and timing resumed after the 30 s.

Interobserver agreement checks were conducted by one additional observer during 25% of the preference assessment, baseline, choice, and no-choice sessions. Interobserver agreement during the preference assessment was calculated by dividing the number of agreements of choice of stimuli by the number of agreements plus the number of disagreements of choice of stimuli and multiplying by 100%. Interobserver agreement of game board completion was computed by dividing the lowest frequency number of recorded game completions in a 10-min peri-

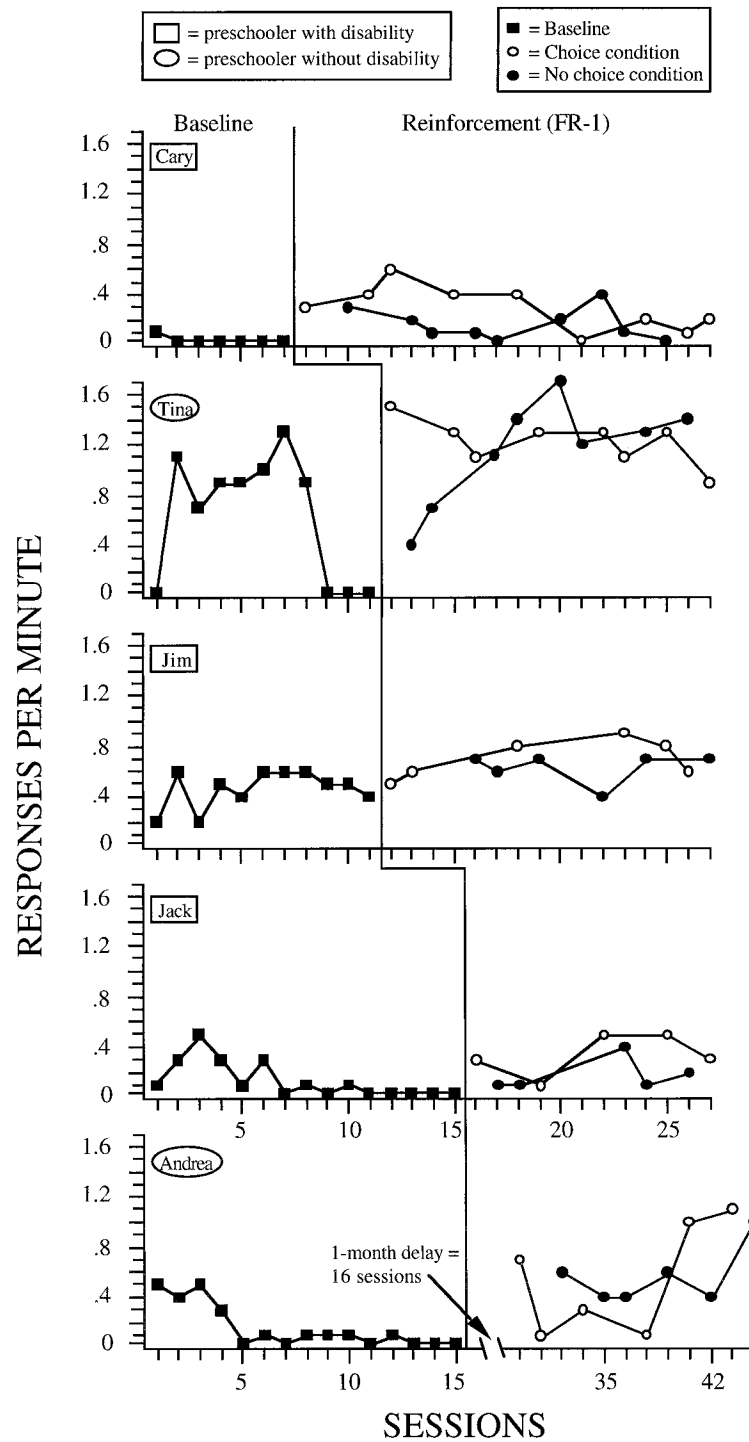


Figure 1. Number of responses per minute of game board completion during conditions with no reinforcement (baseline), reinforcement choice, and no reinforcement choice for Cary, Tina, Jim, Jack, and Andrea. The broken lines in the reinforcement condition represent sessions missed for each participant.

od by the highest frequency number of recorded game completions and multiplying by 100%. Mean agreement percentages across all sessions were above 95%.

RESULTS AND DISCUSSION

Figure 1 shows the response rates of each participant during baseline and choice and no-choice conditions. The rate of responding increased for Tina and Andrea, but there was little if any increase in responding for the other participants. There were no overall differences shown between the choice and no-choice conditions. This result replicated the findings of Lerman *et al.* (1997) in that when a single-operant arrangement was used in choice making and when preference was held constant across conditions, few to no differences were found.

The present investigation is different from past investigations on choice of reinforcers in several important ways. First, participants' preference for stimuli was held constant throughout choice and no-choice conditions, in contrast to most investigations on choice in which preference was not held constant (e.g., Dyer, Dunlap, & Winterling, 1990). Second, the current investigation involved children with and without developmental disabilities. Finally, less preferred stimuli have rarely been used in investigations of choice.

Based on the results of choice-making investigations, two important considerations should be made in future research. First, differences frequently have not been found between choice and no-choice conditions when single-operant arrangements were used and

when preference was held constant across conditions. Alternatively, choice conditions have been shown to result in higher relative rates of responding than no-choice conditions when concurrent-operants schedules were used (Fisher, Thompson, Piazza, Crosland, & Gotjen, 1997). More research should be conducted to investigate the difference between the Fisher *et al.* results and the current results. Second, although less preferred stimuli were used in the current investigation to reduce ceiling effects, these effects may have still been present. It is possible that participants were not able to produce higher response rates because the task required multiple responses. Therefore, future research should investigate whether higher response rates are possible if highly preferred stimuli are used.

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